SENTINEL™

YOUR KEY TO NDT

2008

PRODUCT CATALOG

REVISION MARCH 17, 2008

QSA GLOBAL

GAMMA RAY PROJECTORS

880 Delta
Item No. 880DELTA

880 Sigma
Item No. 880SIGMA

880 Elite
Item No. 880ELITE

880 Series Source Projectors

Model 880 series source projectors are used for industrial applications of gamma radiography to inspect materials and structures in the density range of approximately 2.71 g/cm^3 through 8.53 g/cm^3.

SENTINEL™ Model 880 Delta, 880 Sigma and 880 Elite source projectors are portable, lightweight and compact industrial radiographic exposure devices. The patented device body consists of a titanium 'S' tube and cast depleted uranium (DU) shield contained within a 300 series stainless steel tube with stainless steel discs welded at each end forming a cylinder shaped housing. The discs are recessed to provide protection for the rear mounted locking mechanism and front mounted outlet port.

880 ELITE

880 DELTA

The horizontally oriented design allows the locking mechanism, source assembly connector and outlet port to be easily operated, simplifying connection of source guide tubes and remote controls.

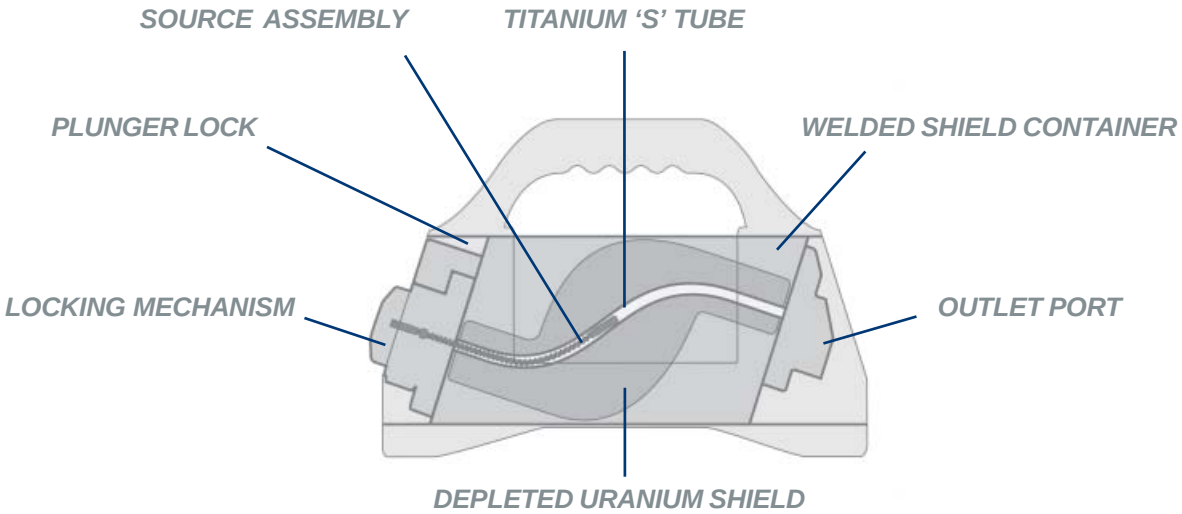
880 SIGMA

880 Patent Numbers

United States	6781114	Canada	2425905 (Pending)
Europe	1325501B	Korea	10-2002-700482 (Pending App. No.)

Jacket Patent Numbers

United States D453570S



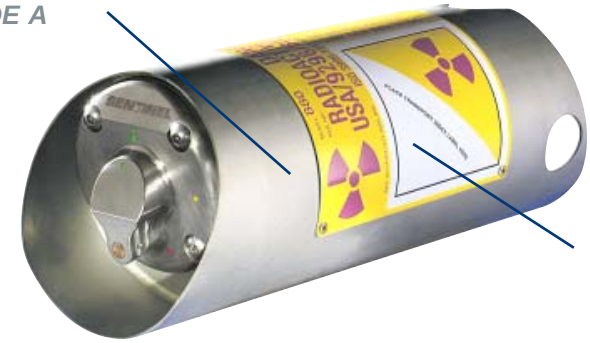
GAMMA RAY PROJECTORS

880 Series Source Projectors

EXPOSURE DEVICE

The exposure device body, containing the DU shield, locking mechanism, outlet port, protective covers and required labels*, comprises the radioactive material transport Type B(U) package.

WELDED MAIN BODY HOUSES THE SOURCE ASSEMBLY INSIDE A TITANIUM 'S' TUBE



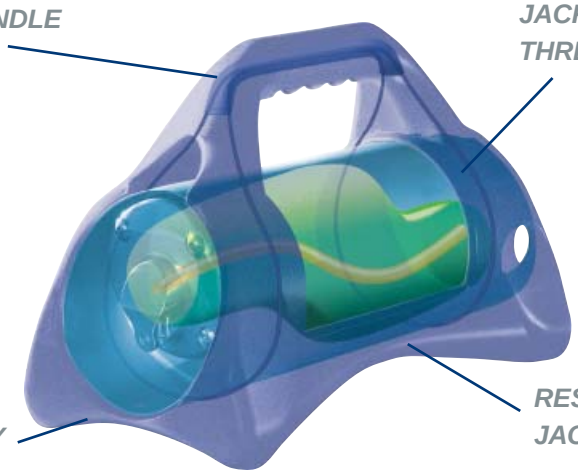
EXPOSURE DEVICE IS COMPLIANT WITH TYPE B PACKAGE EVEN IF JACKET IS REMOVED

REMOVABLE JACKET

An impact resistant plastic jacket surrounds the exposure device to protect labels and provide the means for carrying and placement during radiographic operations. The three models are identified by jacket color; yellow for the 880 Delta, black for the 880 Sigma, and blue for the 880 Elite.

COMFORTABLE CARRYING HANDLE

JACKET CAN BE DRILLED TO ACCEPT THREADED INSERTS



SHAPED BASE AND FEET, AND LOW CENTER OF GRAVITY

RESILIENT ONE-PIECE PLASTIC JACKET

DEVICE/SOURCE MAXIMUM CAPACITY

DEVICE	YTTERBIUM-169		SELENIUM-75		IRIDIUM-192		COBALT-60	
880 Delta	20Ci	0.74TBq	150Ci	5.55TBq	150Ci	5.55TBq	65mCi	2.40GBq
880 Sigma	20Ci	0.74TBq	150Ci	5.55TBq	130Ci	4.81TBq	25mCi	925MBq
880 Elite	20Ci	0.74TBq	150Ci	5.55TBq	50Ci	1.85TBq	25mCi	925MBq

*Multilingual labeling is available upon request.

GAMMA RAY PROJECTORS

680B Projector with OPL

The SENTINEL™ Model 680B source projector combines the penetrating radiation of Cobalt-60 with the mobility provided by the use of depleted uranium shielding. It is designed for the radiography of steel from 1 in to 7 in (25 mm to 175 mm) thick and light alloys 3 in to 15 in (75 mm to 375 mm) thick. All components have been developed to provide safe, reliable service and long life under the harsh conditions of industrial use. The durable case is designed to ease rigging operations.

A lock is incorporated to prevent use by unauthorized personnel. The source cannot be projected until the control cable is correctly connected. The projector can not be locked or the control cable disconnected until the source is safely stored. Projectors with codes that include the letter A or B are fitted with the unique Posilock device which automatically secures the source assembly in the stored position on retraction.

Remote controls allow the operator to control the source at a distances of 35 ft (10.7 m) or 50 ft (15.2 m). When the source is in the exposure position the control can be a total distance of 46 ft (14 m) using 25 ft controls, 63 ft (19.2 m) using 35 ft controls, or 99 ft (30 m) using 50 ft controls.

Item No. TENB680

EXPOSURE DEVICE

DIMENSIONS			SOURCE CAPACITY
Length	21 in	(53 cm)	110Ci (4.07TBq), Cobalt-60
Width	14-3/4 in	(38 cm)	
Height	12 in	(30 cm)	
Mass	465 lb	(211 kg)	

SHIELDING

MATERIAL	MASS	
Depleted Uranium	295 lb	(130 kg)

GAMMA RAY PROJECTORS

Accessories

660 SERIES TYPE B(U) TRANSPORT PACKAGE

The 660 Overpack (OPL-660) is used for safe transport of the 660 series gamma ray projectors with an Iridium-192 source. The overpack consists of a welded steel case fitted with rigid foam and wood inserts to secure the 660.

- Welded steel construction
- Removable cover
- Maximum capacity: 140Ci, Iridium-192
- 18-1/2 in (L) x 8-1/4 in (W) x 14-1/2 in (H) (47 cm (L) x 21 cm (W) x 36-5/6 cm (H))
- 88 lbs

Item No. 66060-1

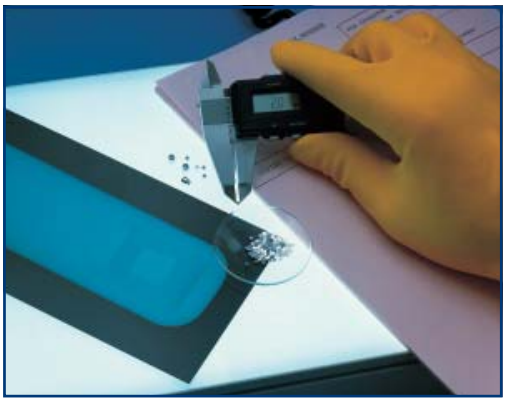
660 SERIES FLOOR MOUNT SECURING FRAME

The 660 Floor Mount secures the 660B gamma ray projector and overpack to the dark room floor.

- Welded stainless steel construction
- 9-3/4 in (L) x 8-3/8 in (W) x 6-3/4 in (H) (24-3/4 cm (L) x 21-1/3 cm (W) x 17-1/8 cm (H)
- 5 lbs

Item No. FM-98-SS

SOURCES & SOURCE HOLDERS



Sources

The SENTINEL™ range of double encapsulated special form sealed source assemblies caters to most industrial applications using gamma radiography.

A choice of isotopes provides solutions for the widely varying requirements demanded by different materials and site conditions. Sources with outputs ranging from less than one curie up to several hundred are available-all precision constructed to ensure the highest possible specific activities and the smallest focal spot sizes.

Source exchange is available as a service either on-site or when source projectors are returned to SENTINEL™ for inspection or overhaul. Sources can be shipped in the source projector or in a suitable returnable transport container.

SELENIUM-75

Selenium-75 sources are available in cylindrical and quasi-spherical focals, permitting shorter SFDs and greater sensitivity on fixed geometries.

IRIDIUM-192

Iridium-192 sources are constructed using iridium metal discs or pellets of uniform size in a welded stainless steel capsule.

COBALT-60

Cobalt-60 sources are constructed using compression fused cobalt metal pellets confined within welded titanium and stainless steel capsules.

YTTERBIUM-169

Ytterbium-169 sources are available in spherical and right circular cylinder focals, housed in a welded titanium alloy capsule.

SOURCES & SOURCE HOLDERS

Sources

ENERGY SPECTRUM AND STEEL WORKING RANGE

ISOTOPE*	SOURCE MODEL**	HALF LIFE	ENERGIES	STEEL WORKING RANGE	
Selenium-75	A424-25W	120 Days	97-401 KeV	.32 in to 1.18 in	(8 mm to 30 mm)
Iridium-192	A424-9	74 Days	206-612 KeV	.47 in to 2.76 in	(12 mm to 70 mm)
Cobalt-60	A424-13, A424-18	5.27 Years	1.17-1.33 MeV	1.97 in to >4.72 in	(50 mm to >120 mm)
Ytterbium-169	918	32 Days	63-308 KeV	.16 in to .79 in	(4 mm to 20 mm)

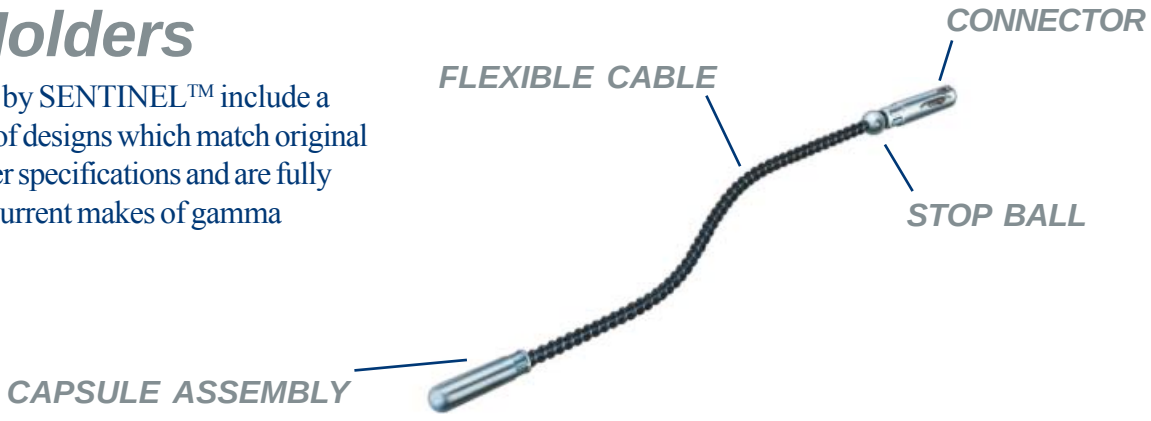
DEVICE/SOURCE MAXIMUM CAPACITY

SENTINEL DEVICE	SELENIUM-75	IRIDIUM-192	COBALT-60	YTTERBIUM-169
880 Delta	150 Ci (5.55 TBq)	150 Ci (5.55 TBq)	65 mCi (2.40 GBq)	20 Ci (0.74 TBq)
880 Sigma	150 Ci (5.55 TBq)	130 Ci (4.81 TBq)	25 mCi (925 MBq)	20 Ci (0.74 TBq)
880 Elite	150 Ci (5.55 TBq)	50 Ci (1.85 TBq)	25 mCi (925 MBq)	20 Ci (0.74 TBq)
979 Crawler Head	25 Ci (925 GBq)			
959M Scar Projector	81 Ci (3 TBq)	15 Ci (555 GBq)		
865 Projector		240 Ci (8.88 TBq)		
741 A/B Projector			33 Ci (1.22 TBq)	
680 A/B Projector			110 Ci (4.07 TBq)	
676 A/B Projector			330 Ci (12.32 TBq)	
660 A Projector	81 Ci (3 TBq)	120 Ci (4.44 TBq)		
660 B Projector	81 Ci (3 TBq)	140 Ci (5.18 TBq)		
OTHER DEVICE	**SELENIUM-75**	**IRIDIUM-192**	**COBALT-60**	**YTTERBIUM-169**
INC-IR100		100 Ci (3.7 TBq)		
SPEC-150		150 Ci (5.55 TBq)		

*Selenium-75 and Iridium-192 use the 650L Source Changer, while Cobalt-60 uses the 770 Source Changer.
**INC-IR100 uses Source Model # 87703, and SPEC-150 uses Source Model # 96901.

Source Holders

Source holders offered by SENTINEL™ include a comprehensive choice of designs which match original equipment manufacturer specifications and are fully compatible with most current makes of gamma radiography projector.



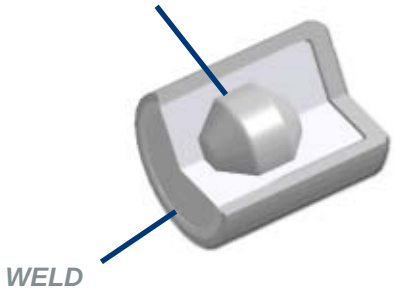
SOURCES & SOURCE HOLDERS

Selenium-75

Selenium-75 sources are available in cylindrical and quasi-spherical focals, permitting shorter SFDs and greater sensitivity on fixed geometries.

- Ideal for controlling the size of the exclusion zone during radiographic exposures at congested work sites
- Optimizes image contrast on radiographic films while lower energy photons provide a better response on storage phosphor plates
- Provides the needed accessibility in fabrications that x-ray generators cannot access

SELENIUM-75 METAL SELENIDE PELLET IN VANADIUM INNER CAPSULE



TECHNICAL SPECIFICATIONS

PELLET DIAMETER		MAXIMUM FOCAL SIZES		NOMINAL ACTIVITIES	
1	mm*	1.4	mm*	4 Ci	(148 GBq)
1.4	mm*	1.9	mm*	8 Ci	(296 GBq)
2	mm	2.2	mm	20 Ci	(740 GBq)
2.5	mm	2.7	mm	40 Ci	(1.48 TBq)
2.85	mm	3.1	mm	60 Ci	(2.22 TBq)
3.25	mm	3.5	mm	80 Ci	(3.00 TBq)

HALF VALUE AND THICKNESS VALUE LAYERS

METAL	HVL		TVL	
Aluminum	27	mm	80	mm
Steel	8	mm	27.5	mm
Lead	1	mm	4.75	mm
Tungsten	.8	mm	4	mm
Concrete	30	mm	90	mm

APPLICATIONS

- Off shore oil rigs and outages at power generation plants where exposure to non-occupational workers (members of the public) is a problem
- Self propelled pipeline crawlers (QSA Global, Inc. Model 979) and directional beam exposure devices used to perform panoramic exposures of pipelines with inner diameters down to three inches (77 mm)

QUASI-SPHERICAL FOCAL

The active focal of the sources are octagon shaped in the range of 1.4 mm to 3.5 mm (maximum focal) to maximize the output in all directions of use while minimizing the focal spot size.

Sources are available in cylindrical and quasi-spherical focals. Compared to a right circular cylinder focal, the unique focal (quasi-spherical) of the Se-75 permits shorter SFDs and greater sensitivity on fixed geometries.

Testing of the metallic selenide sources demonstrates a high degree of thermal safety and material stability.

*Right circular cylinder focal

EXTREME CONDITION CONTROL ASSEMBLY

Handle Control Assembly

A handle control assembly is comprised of the hand crank and gear box, a pair of control housings, a drive cable and a safety connector. The handle grip consists of a light weight housing and hand crank to propel the source to the exposure position and back. The molded handle is specifically designed to maximize crank speed and minimize fatigue. The control housing assembly consists of an outer sheath of flexible cable with a yellow and black cover. The drive cable consists of spiral wound flexible steel.

CONTROL UNITS & COMPONENTS

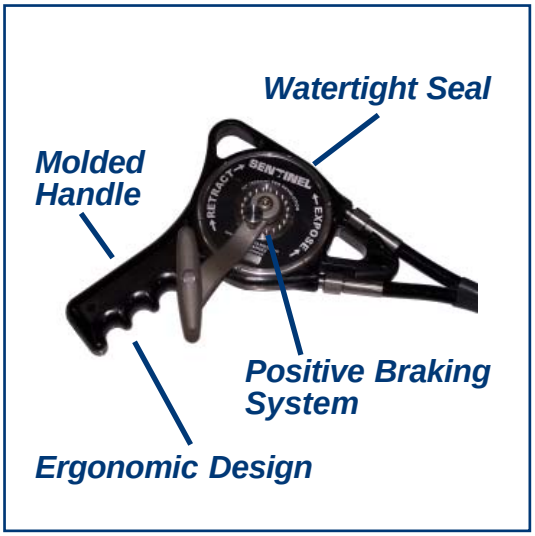
DESCRIPTION	SIZE		ITEM NO.
Extreme Condition Handle Grip Control Unit	25 ft	(7.5 m)	SAN88225
	35 ft	(10.5 m)	SAN88235
	50 ft	(15 m)	SAN88250
Extreme Condition Reverse Handle Grip Control Unit	25 ft	(7.5 m)	SAN88225R
	35 ft	(10.5 m)	SAN88235R
	50 ft	(15 m)	SAN88250R
Extreme Condition Control Housing-Assembled Pair	25 ft	(7.5 m)	95034-25
	35 ft	(10.5 m)	95034-35
	50 ft	(15 m)	95034-50
Drive Cable Assembly with Connector	50 ft	(15 m)	55005
	70 ft	(21 m)	55010
	100 ft	(30 m)	55009
Extreme Condition Handle Grip Assembly			95002
661 Safety Connector Assembly			66103

Applications

Designed to be used with the SENTINEL™ 880 Series Source Projectors as well as the 660 and 680B Gamma Ray Projectors.

Features

- Available in 25, 35 and 50 ft (7.5, 10.5 and 15 m)
- Light weight polyurethane ergonomic handle design
- Water resistant handle assembly preventing ingress of water, dirt and sand
- Control housings are constructed of light weight, nonmetallic 3-ply material twined together for maximum dent resistance
- Yellow and black housings for high visibility during night operations
- Large gear ratio providing one foot of travel per revolution (ALARA)
- Commercial grade sealed ball bearing
- Noncorrosive stainless steel end fittings
- Extreme temperature operation from -40° F to 212° F (-40° C to 100° C)



Designed, tested and manufactured to meet the requirements of ANSI N432-1980 and ISO 3999-1 2000E

CONTROL UNITS & ACCESSORIES

Control Units

A control unit is comprised of the hand crank and gearbox, a pair of control housings, a teleflex drive cable and a safety connector assembly.

CONTROL UNITS & COMPONENTS

DESCRIPTION	SIZE		ITEM NO.	EXTREME CONDITION
Pistol Grip Control Unit	25 ft	(7.5 m)	TAN69225	SAN88225
	35 ft	(10.5 m)	TAN69235	SAN88235
	50 ft	(15 m)	TAN69250	SAN88250
Pistol Grip Control Unit with Odometer	25 ft	(7.5 m)	TAN69325	
	35 ft	(10.5 m)	TAN69335	
	50 ft	(15 m)	TAN69350	
Reel Type Control Unit with Odometer	25 ft	(7.5 m)	TAN66425	SAN88425
	35 ft	(10.5 m)	TAN66435	SAN88435
	50 ft	(15 m)	TAN66450	SAN88450
Land Based Control Box for 865/959 Projector			86550	
Source Expose Hose for 865/959 Projector			86509-6	
Source Return Hose for 865 Projector			86509-7	
Control Housing-Assembled Pair	25 ft	(7.5 m)	59181-25	95034-25
	35 ft	(10.5 m)	59181-35	95034-35
	50 ft	(15 m)	59181-50	95034-50
Drive Cable Assembly with Connector	50 ft	(15 m)	55005	
	70 ft	(21 m)	55010	
	100 ft	(30 m)	55009	
Pistol Grip Control Assembly			69201	
Pistol Grip Control Assembly with Odometer			69301	
Reel Type Control Assembly with Odometer			66402	
661 Safety Connector Assembly			66103	
Control Cable Lock and Fitting Kit			TAN766	

Automatic Exposure Control Unit

The fully automatic motorized wind out system enables radiographers to position a source to expose a radiograph and then retract the source after a pre-set exposure time has elapsed. The system can be used with Cobalt-60 units as well as SENTINEL™ Model 460, 660, and 880 devices.

Item No. GAMMASAFE

SOURCE GUIDE TUBES & STOPS

Source Guide Tubes

Source guide tubes are flexible stainless steel tubes with a protective polyvinyl covering and are available to fit all SENTINEL™ projector units.

Intermediate and termination source guide tubes, which are interconnectable to provide required length, are available. The intermediate section tube has a male connector at one end and a female connector at the other, and can be used with a disconnectable source stop as a guide tube termination.

The extreme condition source guide tube is designed for use in extreme weather conditions. It has a temperature range of -60° to 135° C (-76° to 275° F).

EXTREME CONDITION SOURCE GUIDE TUBE

STANDARD SOURCE GUIDE TUBE

SOURCE GUIDE TUBES & STOPS

DESCRIPTION	PROJECTOR	SIZE		ITEM NO.
Source Guide Tube with Fixed Stop	660, 680, 741, 880	7 ft	(2.1 m)	TAN48906
	676 Only	7 ft	(2.1 m)	TAN67606
Source Guide Tube Extension	660, 680, 741, 880	7 ft	(2.1 m)	TAN48907
	676 Only	7 ft	(2.1 m)	TAN90203
Source Guide Tube Extension with Signal Wire	957, 660E, 680E, & 741E	7 ft	(2.1 m)	TAN44609
	957 & 676E	7 ft	(2.1 m)	TAN40210
Extreme Condition Source Guide Tube with Fixed Stop	660, 680, 741, 880	7 ft	(2.1 m)	95020
Extreme Condition Source Guide Tube Extension	660, 680, 741, 880	7 ft	(2.1 m)	95021
Source Guide Tube Swivel Adaptor (Enables the 660 Guide Tube to be used with the 880 Projector)	880			88081
Removable Source Stop for Guide Tube Extension				TAN691
Removable Source Stop Switch Assembly	957			TAN723

Custom lengths are available for guide tubes and source stops upon request.

POSITIONING DEVICES

CLAMP HOLDER

POSITIONING CLAMP

TRIPOD STAND

Source Positioning Kit

It is recommended that a source stop be held in position with the source positioning kit. The kit is comprised of a tripod stand, adjustable clamp, and clamp holder.

Tripod Stand, Adjustable clamp, and Clamp holder (Complete Kit)
Item No. TAN4021

Positioning Clamp
Item No. 40201-7
Clamp Holder
Item No. 40201-8

Cast Iron Tripod Base
Item No. 40201-9
Tripod Rod
Item No. 40201-9A

J-TUBE ASSEMBLY

Pipe Centering Devices

These devices are designed to hold a radiography source in the center of pipes or other cylindrical vessels, and are especially useful where panoramic radiographs are needed.

Spring loaded wheel and slide types are available to maintain the source stop in the center of the pipe and yet pass freely over the welds. Used with rigid source tubes the devices can be pushed easily along distances up to the limit of the source projector. They are available with threaded fittings on both ends (compatible with the guide tubes), or the standard male thread at one end and an integral source stop on the other. The standard length is 7 feet.
Other lengths are available upon request.

SLIDE TYPE CENTERING DEVICE

PIPE CENTERING DEVICES & J-TUBES

DESCRIPTION	SIZE		ITEM NO.
Wheel	6 in to12 in	(152 mm to 305 mm)	TAN731
	12 in to 24 in	(305 mm to 610 mm)	TAN732
	24 in to 48 in	(610 mm to 1210 mm)	TAN733
Slide	1 in to 2 in	(25 mm to 51 mm)	TAN7341
	2 in to 4 in	(51 mm to 102 mm)	TAN7342
	4 in to 6 in	(102 mm to 152 mm)	TAN7343
J-Tube Assembly			91500

GAMMA RAY COLLIMATORS

Collimators contain and direct the beam of radiation during exposure. A wide range of collimators have been developed to meet the variety of applications and techniques used.

COLLIMATORS

DESCRIPTION	WEIGHT	BEAM SIZE	ATTENUATION	HALF VALUE LAYERS	ITEM NO.
Tungsten	1.75 lb (0.79 kg)	60° conical, side throw	Ir-192: 0.05 Co-60: 0.46	Ir-192: 4.30 Co-60: 1.12	TCN799
	4.3 lb (1.95 kg)	60° conical, side throw	Ir-192: 0.009 Co-60: 0.26	Ir-192: 6.80 Co-60: 1.90	TCN827
	9.5 lb (4.32 kg)	60° conical, side throw	Ir-192: 0.003 Co-60: 0.17	Ir-192: 8.30 Co-60: 2.50	TCN828
	4.3 lb (1.95 kg)	20° x 360° panoramic	Ir-192: 0.0045 Co-60: 0.18	Ir-192: 7.80 Co-60: 2.40	TCN846
Lead	3 lb (1.36 kg)	60° conical, side throw	Ir-192: 0.014 Co-60: 0.32	Ir-192: 6.20 Co-60: 1.70	TCN714
Large Lead Collimator	3 lb (1.36 kg)	60° conical, side throw	Ir-192: 0.014	Ir-192: 6.20	TCN717
Lead Collimator with Lab Stand & Inserts	32 lb (14.5 kg)	20° x 360° panoramic 60° directional	Ir-192: 0.001 Co-60: 0.10	Ir-192: 10.0 Co-60: 3.30	TCN527
527 Collimaor Only	32 lb (14.5 kg)	20° x 360° panoramic 60° directional	Ir-192: 0.001 Co-60: 0.10	Ir-192: 10.0 Co-60: 3.30	52710
360° Panoramic Insert		20° x 360° panoramic			52704
60° Directional Insert		60° directional			52711

DARK ROOMS & EQUIPMENT

Film Illuminators

SENTINEL™ ILLUMINATOR
•Stainless Steel
•AC 110v/50/60Hz
•650W
•On/off foot switch
•4-1/2 in x 17 in viewing area
•Meets ASTM Standard E-1390-06
Item No. DF-2D5S-S

HIGH INTENSITY ILLUMINATOR
•AC 120v/60Hz
•1000 watts of brightness
•On/off foot switch
•4-1/2 in x 17 in viewing area
•Stainless Steel
Item No. QME1001

FILM VIEWER BULBS

DESCRIPTION		ITEM NO.
Photoflood #1	BBA Small	9160900291
Photoflodd #2	EBV Large	9160930291
SENTINEL™ Bulb	Fluorescent Bulb	FT55DL/841

187A HIGH INTENSITY ILLUMINATOR
•Designed for industrial radiography
•1000 watts of brightness
•Electronic brightness control
•On/off foot switch
•Set of 4 steel masks
•24 in (W) x 10 in (H) x 10 in (D)
(60.96 cm (W) x 25.4 cm (H) x 25.4 cm (D))
Item No. TO-1001

185 HIGH INTENSITY ILLUMINATOR
•Ideal for reading industrial film
•6" diameter superbright viewing area
•Electronic brightness control
•On/off foot switch
•Set of steel masks
•9 in (W) x 18 in (H) x 14 in (D)
(22.86 cm (W) x 45.72 cm (H) x 35.56 (D))
Item No. 9160931289

188 BRIGHT SPOT ILLUMINATOR
•Variable intensity illumination
•Rheostat foot switch
•Swivel base
•Adjustable lamp housing
•6 in (W) x 7.5 (H) x 6.75 (D)
(15.24 cm (W) x 19.05 cm (H) x 17.15 cm (D))
Item No. 9160932289

DARK ROOMS & EQUIPMENT

Film Processing Accessories

FLOATING GLASS THERMOMETER
Calibrated from 40° to 120° F
Item No. TO-5010

DIAL THERMOMETER
Range: 0° to 140° F
-20° to 60° C
Item No. 9148020201

COMPARATORS
5 Reticles
Item No. 9161990096
1 Reticle
Item No. TO-F800

HIGH VISION SAFELIGHT
- More usable light in the safe range
- Reusable filter
- 21.5 in (W) x 1.5 in (H) x 3.75 in (D)
(54.6 cm (W) x 3.8 cm (H) x 9.5 cm (D))

Hi-vision safelight (20w)
Item No. 9142300401
Hi-vision safelight (15w)
Item No. 9142300402

Safelight 24 in (60.96 cm) Bulb
Item No. 9142300472
Safelight 18 in (45.72 cm) Bulb
Item No. 9142300471

DARK ROOM SAFELIGHT
- 15 watt lamp
- Can be mounted on a wall or hung from a ceiling
- Plexiglas filter
- 5 in (W) x 7 in (H)
(12.7 cm (W) x 17.78 cm (H))

Item No. SL5-R

DARK ROOMS & EQUIPMENT

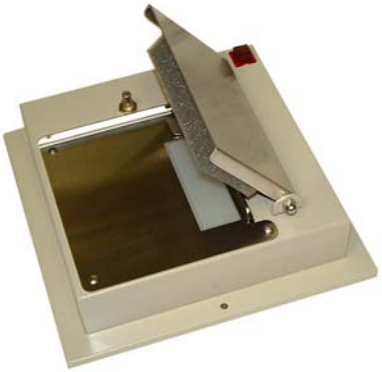
Film Processing Accessories

SM-10T DENSITOMETER

The SM-10T densitometer assures instant, accurate, and repeatable results.

- •Accurate
- •No warm up time
- •Extended battery life
- •Range: 0 to 5.0 D
- •Aperture: 2 mm
- •Weight: 2.5 lb

Item No.TO-SM-10



ID PRINTERS

- •Variable time exposures
- •Table top or recessed units
- •Stainless steel door & template
- •Standard model 143

Item No. 9149201010

Automatic model 144

Item No. 9149202010

POCKET PAL DENSITOMETER

This instrument is accurate to ± .02 from 0.00 to 4.00 Optical Density.

- •Portable
- •Battery operated
- •Range: 0 to 4.0 D
- •Aperture: 3 mm
- •Weight: 5.9 oz

SM-12 Densitometer

Item No. TO-SM-12

SM-14 Densitometer

Item No. TO-SM-14

DENSITY COMPARISON STRIP

5 Step Density Strip

Item No. 5099

21 Step Density Strip

Item No. 5004

DARK ROOMS & EQUIPMENT

Film Processing Accessories

MARKERS

DESCRIPTION	ITEM NO.
Mean-Streak Marker, White	MRK001
Mean-Streak Marker, Yellow	MRK005
Uni-Paint Marker, White	MRK002
Uni-Paint Marker, Yellow	MRK003
Uni-Paint Marker, Red	MRK009
China Marker, White	MRK004
China Marker, Yellow	MRK006
China Marker, Red	MRK010
Nissen Marker Felt Tip, White	MRK007
Nissen Marker Felt Tip, Yellow	MRK008

FILM DEVELOPING HANGERS

SIZE		ITEM NO.
4.5 in x 10 in	(11.43 cm x 25.4 cm)	DH45X10
8 in x 10 in	(20.32 cm x 25.4 cm)	DH8X10
3.5 in x 17 in	(8.89 cm x 43.18 cm)	DH35X17
4.5 in x 17 in	(11.43 cm x 43.18 cm)	DH45X17
14 in x 17 in	(35.56 cm x 43.18 cm)	DH14X17

Other sizes may be available upon request.

FILM FILING ENVELOPES

SIZE		ITEM NO.
4.5 in x 10 in	(11.43 cm x 25.4 cm)	9163110162
4.5 in x 17 in	(36.83 cm x 43.18 cm)	9163110158
5 in x 7 in	(12.7 cm x 17.78 cm)	TO-1054
8 in x 10 in	(20.32 cm x 25.4 cm)	TO-1055
7 in x 17 in	(17.78 cm x 43.18 cm)	9163110144
14 in x 17 in	(35.56 cm x 43.18 cm)	TO-1059

PRINTED ENVELOPES

4.5 in x 10 in	(11.43 cm x 25.4 cm)	ENV001
4.5 in x 17 in	(36.83 cm x 43.18 cm)	ENV002

DARK ROOMS & EQUIPMENT

Exposure Accessories

LEAD SCREENS

- Reduces scattered radiation
- Intensifies image
- Available in two thicknesses
- Available in rolls and all popular sheet sizes
- Available with plastic backing

LEAD SCREENS

DESCRIPTION	SIZE		ITEM NO. (.005")	ITEM NO. (.010")
Lead Screen Roll	2.76 in x 300 ft	(70 mm x 91.44 m)	4547011001	
	2.76 in x 180 ft	(70 mm x 54.86 m)		4547011003
	3.54 in x 300 ft	(90 mm x 91.44 m)	4547011005	
	3.54 in x 180 ft	(90 mm x 54.86 m)		4547011007
	4.5 in x 300 ft	(11.43 cm x 91.44 m)	4547011009	
	4.5 in x 180 ft	(11.43 cm x 54.86 m)		4547011011
	17 in x 95 ft	(43.18 cm x 28.96 m)	4547011002	
	17 in x 45 ft	(43.18 cm x 13.72 m)		4547011004
Lead Screen Sheet	4.5 in x 10 in	(11.43 cm x 25.40 cm)	8011004205	8011004206
	4.5 in x 17 in	(11.43 cm x 43.18 cm)	8011004207	8011004208
	8 in x 10 in	(20.32 cm x 25.40 cm)	8011004213	8011004214
	14 in x 17 in	(35.56 cm x 43.18 cm)	8011004219	8011004220

LEAD SCREENS WITH PLASTIC BACKING

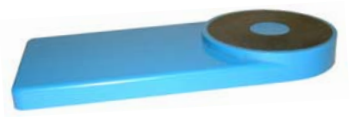
DESCRIPTION	SIZE		ITEM NO. (.005")	ITEM NO. (.010")
Lead Screen Roll	2.76 in x 300 ft	(70 mm x 91.44 m)	LSPB70X300	
	2.76 in x 180 ft	(70 mm x 54.86 m)		LSPB70X180
	3.54 in x 300 ft	(90 mm x 91.44 m)	LSPB35X300	
	3.54 in x 180 ft	(90 mm x 54.86 m)		LSPB35X180
	4.5 in x 300 ft	(11.43 cm x 91.44 m)	LSPB45X300	
	4.5 in x 180 ft	(11.43 cm x 54.86 m)		LSPB45X180
	17 in x 95 ft	(43.18 cm x 28.96 m)	LSPB17X95	
	17 in x 54 ft	(43.18 cm x 16.46 m)		LSPB17X54
Lead Screen Sheet	4.5 in x 10 in	(11.43 cm x 25.40 cm)	LSPB45X1005	LSPB45X1010
	4.5 in x 17 in	(11.43 cm x 43.18 cm)	LSPB45X1705	LSPB45X1710
	8 in x 10 in	(20.32 cm x 25.40 cm)	LSPB8X1005	LSPB8X1010
	14 in x 17 in	(35.56 cm x 43.18 cm)	LSPB14X1705	LSPB14X1710

DARK ROOMS & EQUIPMENT

Exposure Accessories

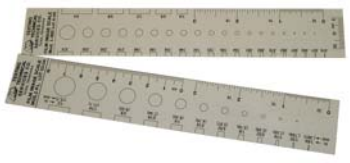
LEAD LETTERS & FIGURES

MAGNETIC FILM HOLDER



PADDLE MAGNET

EXPOSURE CALCULATOR



FILM IMAGE SCALES

LEAD LETTERS & FIGURES

•100 Figures per package
•Available in flat face and deep block
Item No. TO-6051
Red Case for Lead Figures
8 in x 12 in (20.32 cm x 30.48 cm)
Item No. 9132901002
SENTINEL™ Lead Letters & Figures
Item No. R-1
SENTINEL™ Lead Letters (50 Each) with Case
Item No. R-50

MAGNETIC FILM HOLDER

•50 lb Pull magnet attached through a steel spring arc
•Useful for curved ferrous based surfaces
Item No. 91340203

PADDLE MAGNET

•High impact plastic
•Ring magnet attached to 3 in x 4 in
(7.62 cm x 10.16 cm) plastic flap
Item No. MAG003

RADIOGRAPHIC EXPOSURE CALCULATORS

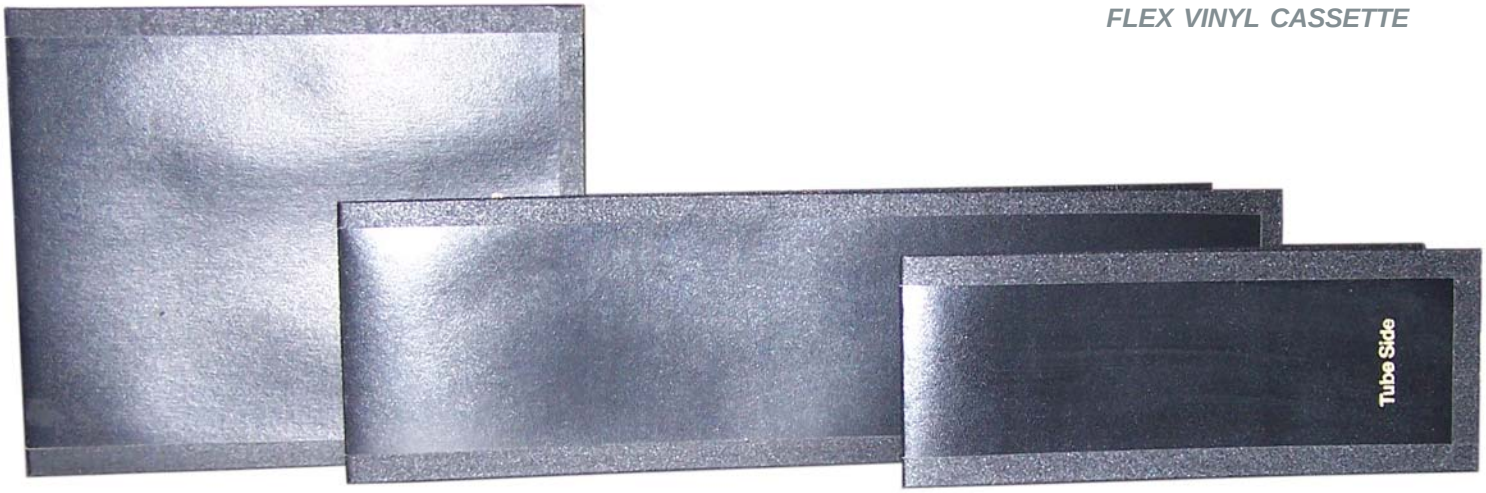
Cobalt-60 & Iridium-192 Exposure Calculator with Leather Case
Item No. 534
Cobalt-60 & Iridium-192 Cardboard Exposure Calculator
Item No. 752
Radiation Safety Calculator
Item No. CAL001

FILM IMAGE SCALES

Transparent scales designed to assist in the sizing of linear and rounded material discontinuities
Film Image Scale, 1-IND
Item No. SCALE001
Film Image Scale, 1-PL
Item No. SCALE002

DARK ROOMS & EQUIPMENT

Exposure Accessories



FLEX VINYL CASSETTE

FILM CASSETTES

DESCRIPTION	SIZE		ITEM NO.
Cloth Belting	2.76 in	(70 mm)	9133020096
	3.54 in	(90 mm)	91330209
	4.5 in	(114.30 mm)	91330210
Flex Vinyl	2.76 in x 10 in	(70 mm x 25.40 cm)	9133010175
	2.76 in x 17 in	(70 mm x 43.18 cm)	9133010176
	3.5 in x 10 in	(8.89 cm x 25.40 cm)	9133010169
	3.5 in x 17 in	(8.89 cm x 43.18 cm)	9133010166
	4.5 in x 10 in	(11.43 cm x 25.40 cm)	9133010162
	4.5 in x 17 in	(11.43 cm x 43.18 cm)	9133010158
	5 in x 7 in	(12.70 cm x 17.78 cm)	9133010153
	7 in x 17 in	(17.78 cm x 43.18 cm)	9133010144
	8 in x 10 in	(20.32 cm x 25.40 cm)	9133010137
	10 in x 12 in	(25.40 cm x 30.48 cm)	9133010127
	14 in x 17 in	(35.56 cm x 43.18 cm)	9133010111
Canvas Magnetic	4.5 in x 10 in	(11.43 cm x 25.40 cm)	TO-1238
	4.5 in x 17 in	(11.43 cm x 43.18 cm)	TO-1239
	7 in x 17 in	(17.78 cm x 43.18 cm)	TO-1241

DARK ROOMS & EQUIPMENT

Exposure Accessories

PLAQUE STYLE PENETRAMETERS

- Rigidly conform to specifications and code requirements
- Lead figures identify the penetrameter size
- Chemical etchings identify the penetrameter material

Item No. TO-0600
Penetrameter case, set A
Item No. 9131000090
Penetrameter case, set B
Item No. 9131000091

PENETRAMETER CASE

MATERIAL GROUPS	SPECIFICATION	SIZE
Group A	ASMEV	#5 through #50
Aluminum	ASTM	#52 through #100
Steel	AWS	
Stainless Steel	API	.06 in through 2.5 in (1.52 mm through 63.5 mm)
Group B	MIL-453	2.6 in through 5.0 in
Aluminum Bronze	NAVSHIPS	(66.04 mm through 12.7 cm)
Brass		
Copper		
Cupro-Nickel		
Inconel		
Magnesium		
Monel		
Nickel		
Phosphor-Bronze		
Titanium		

WHEN ORDERING PLEASE SPECIFY
- Material group
- Specification
- Thickness to be radiographed

ASTM E-747 WIRE STYLE PENETRAMETERS

- Encapsulated in vinyl for durability
- Available in steel, stainless steel, aluminum and copper
- Available in three styles and sizes

Item No. TO-0600

SET B, STYLE 1

SETS	THICKNESS RANGE	WIRE LENGTH		
Set A	.25 in through .75 in (6.35 mm through 19.05 mm)	1.3125 in (3.33 cm)	2 in (5.08 cm)	3 in (7.62 cm)
Set B	.75 in through 1.7 in (19.05 mm through 43.18 mm)	1.3125 in (3.33 cm)	2 in (5.08 cm)	3 in (7.62 cm)
Set C	1.7 in through 4.0 in (43.18 mm through 101.6 mm)	1.3125 in (3.33 cm)	2 in (5.08 cm)	3 in (7.62 cm)

STEP WEDGES

- Used for the calibration of x-ray machines and evaluation of techniques
- Available with 4, 8 or 16 steps

Item No. TO-6060

MATERIAL	SIZE
Aluminum	4 Step
Steel	8 Step
Stainless Steel	16 Step
Magnesium	
Brass	
Cupro-Nickel	

3/4 in X 2 in SHIMS

- Used under penetrameters to compensate for thickness
- Available in 1/16 in. increments from 1/16 in. through 1 in.
- Allow 1/8 in. clearance
- Material and size information marked on each shim

Item No. TO-0616

MATERIAL	SIZE
Aluminum	.015 in through .05 in
Steel	(.38 mm through 1.27 mm)
Stainless Steel	.06 in through .25 in
Magnesium	(1.52 mm through 6.35 mm)
Brass	.31 in through .50 in
Copper	(7.87 mm through 12.7 mm)
Titanium	.56 in through 1.0 in
Cupro-Nickel	(14.22 mm through 25.44 mm)

DARK ROOMS & EQUIPMENT

Dark Rooms

FEATURES

•Fiberglass construction
•Wood frame
•Insulated roof and walls
•Five to eight 115v AC outlets
•12v DC outlet

6 ft (1.83 m) Dark Room
Item No. DKRM-C6
8 ft (2.44 m) Dark Room
Item No. DKRM-C8
8 ft (2.44 m) Dark Room with Generator
Item No. DKRM-C8R
Developing Tank

Film Processing Accessories

TIMER

•Bell timer
•Luminescent dial
Item No. 9143920002

DIGITAL TIMER

Digital stop watch, 0-99 min
Item No. S90861

FILM DEVELOPING REELS

70 mm plastic reel
Item No. 9145920005
90 mm plastic reel
Item No. 9145920008

SOLUTION AGITATOR

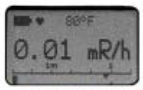
Stainless steel solution agitator
Item No. 9129330101

IMMERSION HEATERS

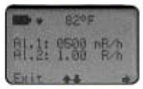
306 with thermostat
Item No. 9155910001
3150SS without thermostat
Item No. 9155910003

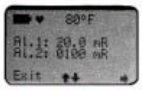
Personal Dosimetry

SENTINEL™ RADEYE G PORTABLE DOSE AND DOSE RATE METER



Survey Meter Mode





FEATURES

- Rugged and Reliable
- Nylon holster or optional see-through holster
- Removable rubber sleeve for extra protection
- Water resistant
- Low power technology (600 hour operation)
- LCD Screen can be rotated 180°
- Battery life indicator
- Large display with backlight
- Top alarm indication (Can be operated in holster)
- PC-software with real-time graph
- 1600 data points (Allows retrospective analysis)
- Adaptable user interface
- Earphone output for noisy environments
- Alarm relay output for area monitor applications

DEVICE SPECIFICATIONS

	DESCRIPTION
Radiation Type	Gamma and X-ray
Dimensions	3.8 in x 2.4 in x 1.2 in (96 mm x 61 mm x 31 mm)
Weight	5.64 oz (160 g)
Measuring Range Dose Rate Dose	 0.01 mR/h to 10 R/h (0.1 µSv/h to 100 mSv/h) 0.01 mR to 66 R (0.1 µSv to 66 mSv)
Energy Range	45 keV - 1.3 MeV
Linear Accuracy	± 10% within measurement range
Power Requirements	600 hour operation depending on mode
Batteries	2 AAA alkaline or rechargeable
Data Management	1600 data points (mean/max.)
Audible Alarm Intensity	>85 dB at a distance of 30 cm
Operating Temperature	-4° F to 122° F (-20° C to 50° C)

DIGITAL SURVEY METER

- Measuring range: 0.01 mR/h to 10 R/h (0.1 µSv/h to 100 mSv/h)
- Overload indication: 10 R/h up to 1000 R/h (100 mSv/h up to 10 Sv/h)
- Energy range: 45 keV-1.3MeV
- Energy compensated GM Tube

RATE ALARM

- Two programmable alarm thresholds for dose and dose rate
- Selectable anywhere from 0.01 mR/h to 9999 mR/h
- Audible, visual and vibrating alerts (Earphone optional)

ELECTRONIC PERSONAL DOSIMETER

- Displays accumulated personal dose
- Records mean/max dose rate
- Records accumulated dose
- PC-software for data analysis and instrument configuration (optional)
- Audible, visual and vibrating alerts (Earphone optional)

SOFTWARE

All settings and the data analysis can be done by an optional Windows™ based PC-software and an accompanying reader device.

RadEye G Gamma Survey Meter
Item No. 425067450
Holster
Item No. 425067046
Desktop Holder
Item No. 42506706001
PC Adapter Cable
Item No. 4254029
Earphone
Item No. 425067037
User Software (RadEye.Exe)
Item No. 425069951
Calibration Software (Cal-RadEye.Exe)
Item No. 425069952

RADIATION SAFETY

Survey Meters

ND-2000 SURVEY METER

ND-2000 SURVEY METER
•Rugged, watertight, dutsproof radiographic survey meter
•Two piece nylon reinforced fiberglass case
•Large 3.5 in Mil-Spec meter indicator
•Meter face in both mR/hr and uSv/hr
•Three Ranges: 0 to 10, 0 to 100 and 0 to1000 mR/hr
•6.25 in (H) x 4.4 in (W) x 7.75 in (L)
(15.88 cm (H) x 11.18 cm (W) x 19.69 cm (L))
Item No. TAN2000
ND-2000A
Includes Audio
Item No. TAN2000A
ND-2000C
Includes Dosimeter Charger
Item No. TANC2000

ND-200P SURVEY METER
•Thin end window probe survey meter
•Two piece nylon reinforced fiberglass case
•Large 3.5 in Mil-Spec meter indicator
•Meter face in both mR/hr and CPM
•Four Ranges: 0 to 0.2, 0 to 2 and 0 to 200 mR/hr
•8 in (H) x 4.4 in (W) x 7.75 in (L)
(20.32 cm (H) x 11.18 cm (W) x 19.69 cm (L))
Item No. TO-GES200P

Specialty survey meters are available upon request.

Personal Dosimetry

ND-138 DOSIMETER
•Direct gamma and x-ray dosimeter
•0-200 mR Measuring range
•Temperature Range: -20° to 50° C
•4.5 in (L) x 0.6 in (D)
(11.43 cm (L) x 1.52 cm (D))
Item No. TAN300
Leather Dosimeter Pouch
Item No. POU-001

RA-500 RATEMETER
•Die cast aluminum belt worn rate alarm
•Alarms at 500 mR ± 20%
•24 Turn calibration potentiometer
•2.5 in (W) x 4.25 in (L) x 1.25 in (D)
(6.35 cm (W) x 10.79 cm (L) x 3.18 cm (D))
Item No. TANRA500

ND-15 AUDIBLE ALARM
•Die cast aluminum belt worn alarm
•Dual range for continuous warning
•Alarm output is 100 decibles at 6 inches
•2.5 in (W) x 4.25 in (L) x 1.25 in (D)
(6.35 cm (W) x 10.79 cm (L) x 3.18 cm (D))
Item No. TAN0132

ND-100 DOSIMETER CHARGER
•Direct reading dosimeter charger
•Compatible with all dosimeters
•Activated by contact with dosimeter
•3.4 in (H) x 3.6 in (W) x 4.6 in (L)
(8.64 cm (H) x 9.14 cm (W) x 11.68 cm (L))
Item No. TAN100

Teletector Dose Rate Meter

TELETECTOR 6112M

The Teletector 6112M is a microprocessor controlled dose rate meter used to measure gamma radiation and detect beta radiation.

- Stainless steel telescope extendable up to 13 ft (4 m)
- Wide dose rate range with automatic range switching
- Illuminated LCD with analog and digital display
- Storage up to 450 records

ACCESSORIES

- Earphone
- PC Cable
- Data Processing Software
- Probe Cover
- Aluminum Case

TELETECTOR 6112M

•Energy Range:	45 keV to 1.3 MeV
•Dose Measurement Range:	1 µR to 999 R (10 µSv to 9.99 Sv)
•Dose-Rate Measurement Range:	1 µR/h to 999 R/h (10 µSv/h to 9.99 Sv/h)

Item No. NIGB9000

TELETECTOR 6150ADT

The Teletector 6150ADT consists of the dose rate meter 6150AD5/6 and the detachable Teletector Probe 6150AD-t. The 6150AD5 and 6150AD6 have different dose rate and energy ranges, and serves as the power supply for Teletector Probe 6150AD-t. Please ask for details when ordering.

- Stainless steel telescope extendable up to 13 ft (4 m)
- Wide dose rate range with automatic range switching
- Portable, hand held battery operated dose rate meter with robust waterproof aluminum die-cast housing

ACCESSORIES

- Probe Cover
- Aluminum Case

TELETECTOR 6150ADT

•Energy Range:	65 keV to 3 MeV
•Dose Measurement Range:	1 µR to 999 R (10 µSv to 9.99 Sv)
•Dose-Rate Measurement Range:	1 µR/h to 999 R/h (10 µSv/h to 9.99 Sv/h)

Item No. NIGB6240 (For 6150AD-t Teletector Probe)
Item No. NIGB6000 (For 6150AD5 Dose Rate Meter)
Item No. NIGB6001 (For 6150AD6 Dose Rate Meter)

RADIATION SAFETY

Area Monitors

ND-AM MONITOR

ND-AM REMOTE AREA MONITOR

•120V AC Dual range area monitor with selectable alarm trip points
•Radiography ranges: 0 to 50 and 0 to 500 mR/hr
•X-ray ranges: 0 to 5 and 0 to 50 mR/hr
•Two 120V AC remote alarm trip outlets
Item No. TANAM
ND-AM+
Includes Siren with 80 to 95 decibles at two feet
Item No.TANAM*
ND-AM1 Light
Portable red rotating warning light with stand and 25 ft (7.62 m) cable
Item No. TANAM1
ND-AM2 Light
Portable red rotating light with stand, siren, and 25 ft (7.62 m) cable
Item No. TANAM2
ND-AM3 Siren
Portable siren with stand and 25 ft (7.62 m) cable
Item No. TANAM3

ND-4000B MONITOR

ND-4000 AREA MONITOR

•Portable 12V DC area monitor with battery charger
•Standard trip point set at 2mR/hr
•Audio piezo alert
•Large red strobe warning light
•12 in (H) x 10.8 in (W) x 8 in (D)
(30.48 cm (H) x 27.43 cm (W) x 20.32 cm (D))
Item No. TAN4000

ND-4000B AREA MONITOR

•Portable 120V AC hard wired or plug in area monitor
•Internal detector
•Non-adjustable trip point set at 2mR/hr
•Two 5 AMP 120V AC remote alarm outlets
•9 in (H) x 8 in (W) x 5 in (D)
(22.86 cm (H) x 20.32 cm (W) x 12.70 cm (D))
Item No. TAN4000B
ND-4000BH
Hard wired only
Item No. TAN4000BH
ND-4000BL
Includes red rotating light
Item No. TAN4000BL
ND-4000BLA
Includes red rotating light and built in audio alarm
Item No. TAN4000BLA

RADIATION PROTECTION

Radishield Radiation Protection System

The Radishield Radiation Protection System is a patented totally encapsulated shielding system. Its unique formulation gives flexible shielding in inaccessible and restricted applications where traditional methods of shielding are difficult to provide. Available in flat sheets of special sizes and guide tube shields of standard and custom lengths, Radishield provides the necessary protection for any NDT company.

Radishield Guide Tube Shield (5 ft)

Item No. 94330

Radishield Polyurethane Lead Flat Sheet (1 ft X 3 ft)

Item No. 93000

Radishield Silicone Lead Flat Sheet (1 ft X 3 ft)

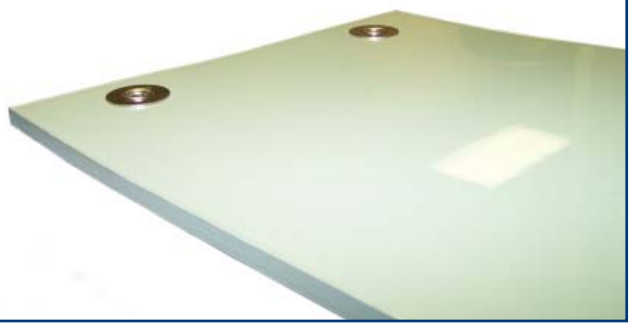
Item No. 93050

Silicone Tungsten Guide Tube Shield

Benefits

- High flexibility
- Low on-site installation time
- Custom sizes available
- Lead free sheets available
- A hermetically sealed encased system allows for no sharp edges and no surface oxidation of lead
- Impermeable to water, dirt and other contaminates
- Flat sheets available in polyurethane and silicone
- Easy to clean

Polyurethane Lead Flat Sheet



ATTENUATION

RADISHIELD	IRIDIUM-192	COBALT-60	CESIUM-137
Tungsten Guide Tube Shield .130 in (3.3 mm) Tungsten	50%	20%	N/A
Polyurethane Flat Sheet .130 in (3.3 mm) Pb	50%	20%	31%
Silicone Flate Sheet .130 in (3.3 mm) Pb	50%	20%	31%

Silicone Lead Flat Sheet

RADIATION SAFETY

Warning Tape & Signs

WARNING SIGNS

DESCRIPTION	SIZE	RADIATION AREA	HIGH RADIATION AREA	RADIOACTIVE MATERIAL
30 Gauge Steel	7 in x 10 in (17.8 cm x 25.4 cm)	9481311101	9481311201	9481311401
Lexan	7 in x 10 in (17.8 cm x 25.4 cm)	9481411101	9481411201	9481411401
Vinyl	7 in x 10 in (17.8 cm x 25.4 cm)	94818111	94818112	94818113

WARNING LABELS

Cargo Aircraft Label
•4-3/4 in x 4-5/16 in
(12.7 cm x 10.95 cm)
•500 per roll
Item No. 4217002010
Class 7 Radioactive II Label
•3.94 in x 3.94 in
(100 mm x 100 mm)
•500 per roll
Item No. 4217002005
Class 7 Radioactive III Label
Item No. 4217002006

RADIATION AREA TAPE

STRIPED TAPE

BARRIER ROPE & TAPE

Alternating Yellow and Magenta
Stripe Tape
3/4 in x 150 ft
(19.05 mm x 45.72 m)
Item No. 9482000207
Alternating Yellow and Magenta
Stripe Tape
2 in x 150 ft
(5.08 cm x 45.72 m)
Item No. 9482000208

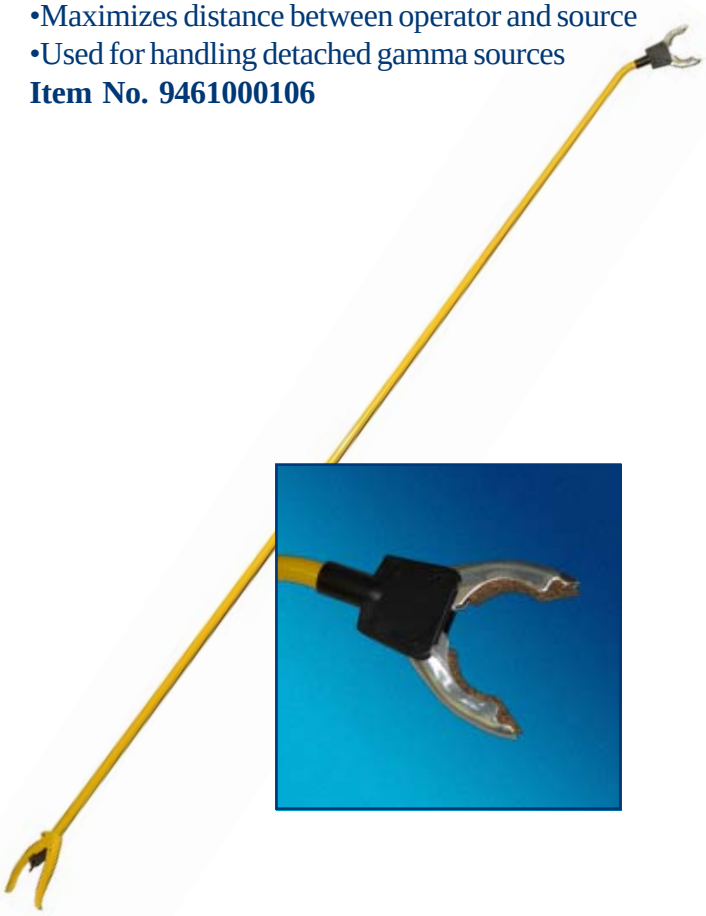
Yellow and Magenta Durable
Polypropylene Rope
5/16 in diameter
(7.88 mm diameter)
Item No. 9482000102
Radiation Area Tape
3 in x 1000 ft
(7.62 cm x 304.8 m)
Item No. 9482000209

RADIATION SAFETY

Accessories

REMOTE HANDLING TONGS

•6-1/2 ft (2 m)
•Emergency source retrieval
•Maximizes distance between operator and source
•Used for handling detached gamma sources
Item No. 9461000106



MANUALS

Radiation Safety Handbook
MAN-002
Case History of Radiographic Events
MAN-003
Working Safely in Gamma Radiography
MAN-005
660 Projector Operating and Maintenance Manual
MAN-006
741/680/676 Projector Manual
MAN-008
773 Calibrator Manual
MAN-011
460 Projector Operating and Maintenance Manual
MAN-016
650L Source Changer Manual
MAN-020
880 Projector Operating and Maintenance Manual
MAN027

EMERGENCY SOURCE STORAGE CONTAINER

Operation of the Safe Store storage container is intended for emergency use only in source retrieval situations. It will hold up to four sources with a total activity of 206 Ci, Ir-192. The shielding materials are lead and tungsten, so there is no depleted uranium liability.

The storage container comes complete with a lockable steel storage cage, restricting access to the inner storage pot. The cage reduces the surface dose rate on the container.
Item No. SAFESTORE

RADIATION SAFETY

Survey Meter Calibration Devices

773 SURVEY METER CALIBRATOR

The Model 773 calibrator allows for the calibration of a survey instrument without changing its position. It permits the safe, accurate calibration of instruments used for surveying gamma radiation. The calibrator also enables users of dosage-measuring equipment to perform routine checks to meet the regulations of the N.R.C. and Agreement States.

The heavy-duty lead container holds 200 mCi (7.40 GBq) of Cesium-137 encapsulated at one end of a control rod. The source is exposed by raising the source rod. The reading is noted and recorded and the source is returned to the stored position. This reading is checked against the actual intensity.

A built-in tape measure helps determine the distance from the Cesium-137 source to the instrument being calibrated. A padlock prevents unauthorized use of equipment. And, a convenient handle is provided for carrying the calibrator.
Item No. TMN773

FEATURES

- Self-contained
- Safety
- Low surface dose rate (< 200 mR/h)
- Convenience
- Traceable
- Reliable manual operation
- Capability
- Lightweight

SPECIFICATIONS

DIMENSIONS			SOURCE CAPACITY
Length	5 in	(12.7 cm)	200 mCi (7.40 GBq), Cesium-137
Width	5 in	(12.7 cm)	
Height	8.5 in	(21.6 cm)	
Mass	52 lb	(23.6 kg)	

SERVICES

Disposition & Remediation

QSA Global, Inc. can provide all of the services needed for the disposition of all of your radioactive sources and materials. The service includes:

- Packaging your sources
- Leak testing of sealed sources
- D.O.T. approved shipping containers
- Preparation of dangerous goods forms
- Transportation of your sources and material
- Removal or unloading of sources
- Letter of receipt and possession for all sources and material

We are able to accept a wide variety of Radioactive Sealed Sources and material used in Medical, Analytical, Industrial Gauging, Industrial Radiography, and Research and Development fields.

INDUSTRIAL GAUGING

- Density Gauges
- Level Gauges
- Thickness Gauges
- Moisture Gauges
- Gamma Scanning Devices

INDUSTRIAL RADIOGRAPHY

- Depleted Uranium Projectors
- Depleted Uranium Collimators
- Survey Meter Calibrators
- Pipeline Crawler Control Devices

MEDICAL

- Brachytherapy Tubes
- Sr-90 Eye Applicators
- Flood Sources
- Dose Calibration Sources
- Reference Standards

ANALYTICAL

- Alloy Analyzers
- Gas Analyzers
- Well Logging Sources
- Explosive Detection

TRAINING COURSES & SEMINARS

2008
Course Information

Contact Tara Insalaco for Registration & Scheduling Information
Phone: 800-815-1383 Ext. 202 or 781-505-8202
Fax: 781-564-2702
tara.insalaco@qsa-global.com

(Baton Rouge, Louisiana) March 11-12
October 9-10

ADMINISTRATORS' SEMINAR
2 Days (16 Hours)

The seminar covers key aspects in the establishment and management of Isotope Radiography Programs to assure conformance to applicable regulations. Specific emphasis is placed on current, proposed and new regulations covering NRC, DOT, IAEA, and Agreement State Legislation.

(Edmonton, Canada) January 3-4
February 4-5
(Baton Rouge, Louisiana) April 7-8
(Edmonton, Canada) May 5-6
August 4-5
(Edmonton, Canada) September 8-9
October 20-21

INSPECTION & MAINTENANCE
2 Days (16 Hours)

The seminar covers design, approvals, QA requirements, daily inspections, formal inspections and maintenance of Isotope radiography systems. You will be trained to maintain and inspect Gamma Ray projectors and accessories that are essential per 10 CFR 34 and 10 CFR 71 QA requirements.

March 3-7
June 2-6
August 18-22
November 3-7

RADIATION SAFETY COURSE
5 Days (40 Hours)

The training covers the basics of radiation safety for industrial radiography that meets the requirements of 10 CFR34.43 (g) and prepares the attendee for radiographer certification (ASNT-IRRSP-1A). Training includes practical sessions for survey instrument calibration, operation of exposure devices, conducting surveys, set-up of controlled areas, source exchanges, leak testing, daily inspections performed by radiography personnel and formal maintenance requirements.

(Edmonton, Canada) January 5-7
February 6-8
(Baton Rouge, Louisiana) April 9-11
(Edmonton, Canada) May 7-9
August 6-8
(Edmonton, Canada) September 10-12
October 22-24

RETRIEVAL COURSE
2-1/2 Days (24 Hours)

You will be trained to conduct or supervise the safe recovery of isotope radiography sources involved in accident or malfunction situations. The course covers cause and prevention, planning and assessment, exposure determination, shielding and operational guidelines. The course includes a half day lab session and a session for reporting and root cause determination.

TRAINING COURSES & SEMINARS

SENTINEL™ Course Registration Form

COURSE NAME _____

DATE REGISTERED _____

DATE OF COURSE _____

CONTACT NAME _____

TELEPHONE NO. _____

FAX NO. _____

COMPANY NAME _____

EMAIL ADDRESS _____

BILLING ADDRESS _____

_____

STUDENT NAME(S) _____

_____

MAILING ADDRESS _____

_____

_____

PAYMENT INFORMATION

PURCHASE ORDER NO. _____

CHECK NO. _____